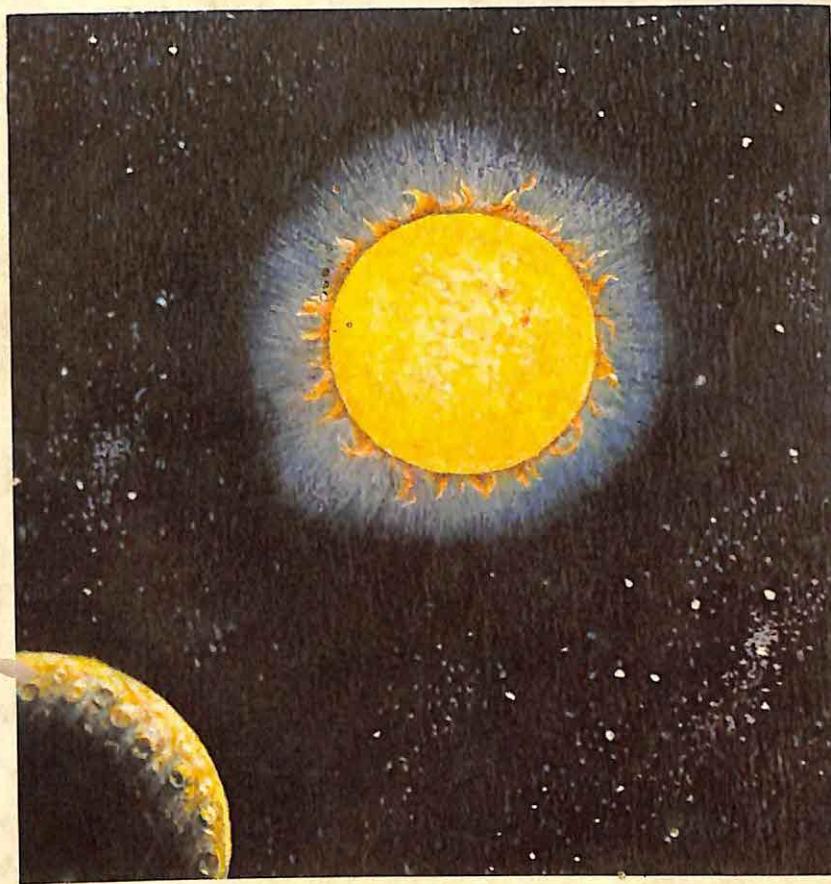




Space

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Dolphin
Science
Book 3

MARIAN TELLANDER

The **Dolphin Science Books** are for children from six to nine years old.

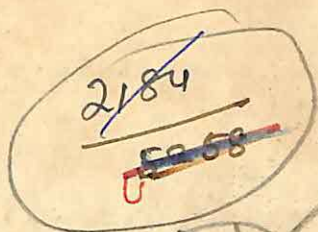
The writing is simple but always clear, and informative; the vocabulary has been carefully chosen to suit the age group.

These books were first published in America, but text and illustrations have been edited for English children, so that there should be no unfamiliarity.

Space is very much in our minds nowadays. This is a clear explanation of a complicated subject, enlivened by cheerful pictures in full colour.

Dolphin Science Books

SPACE



Dolphin Science Books

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SPACE

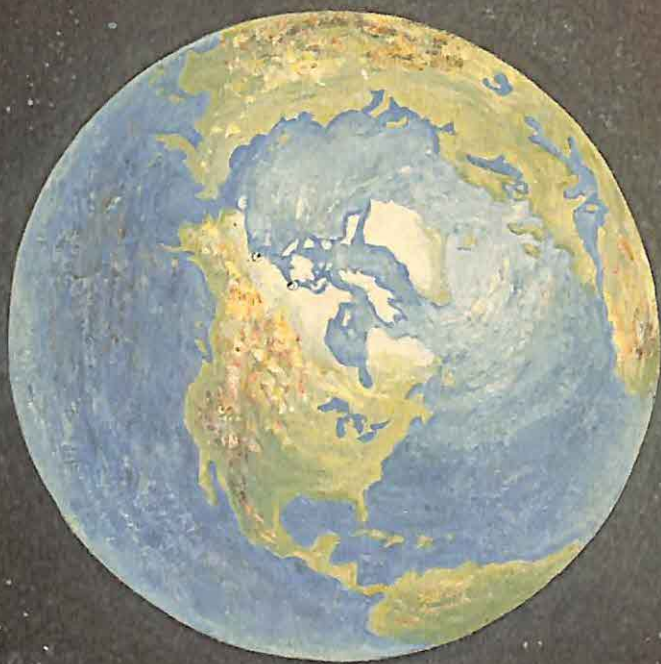
Marian Tellander

Illustrated by Robert Hodgell



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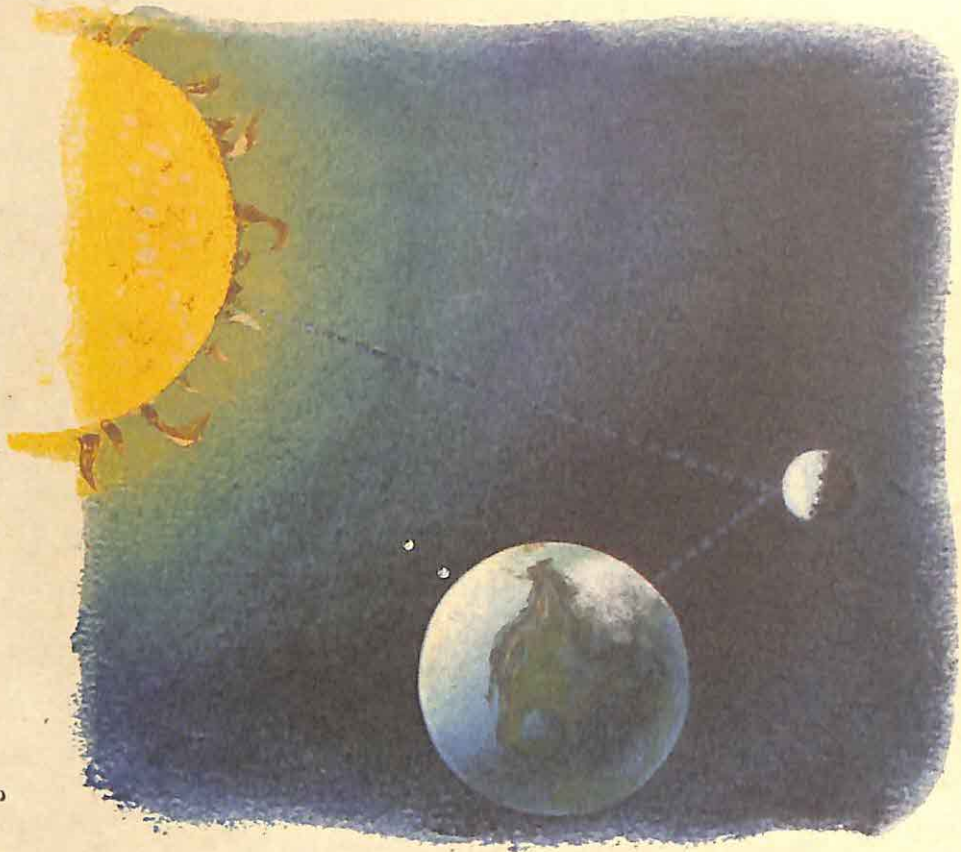


Every time we look out-of-doors, we see
a little bit of Earth.

When we ride in an aeroplane, we see more.

If we went up, up, up until we were
a long way out in space, we could see
half of Earth at once.

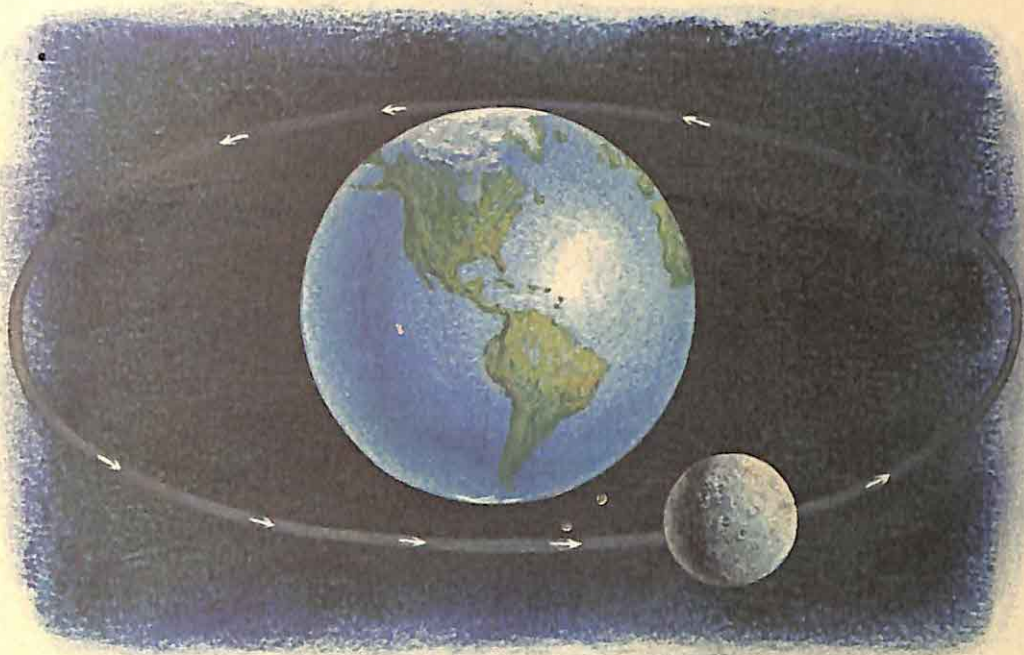
It would look like a big bright ball,
shining in black space.



Earth has many neighbours in space.
The nearest neighbour is the moon.

The moon is a rough ball of rock.
It is not as large as Earth. The moon has
no air, water, clouds, rain or snow.

Plants such as we have on Earth
cannot grow on the moon.



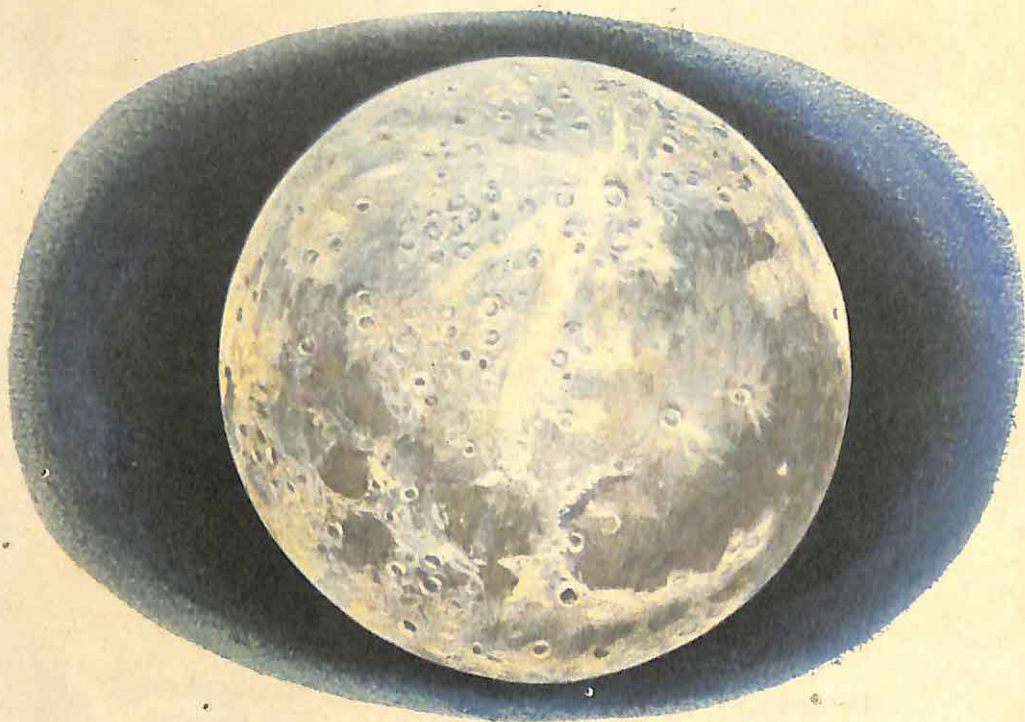
The moon travels round Earth.

The path of the moon round Earth is called the moon's orbit. It takes the moon a little more than 27 days to travel round Earth.

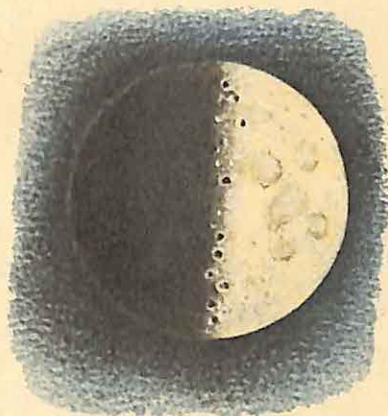
The same side of the moon always faces Earth. No one has seen the other side of the moon, but pictures have been taken of it.

The moon shines because it behaves like a mirror. It throws back, or reflects, the light of the sun. The moon does not give off any light of its own.

Sometimes the moon looks like a great round ball. We call this full moon. Then the sun is shining on the side of the moon that faces us.



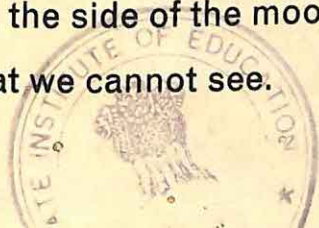
Sometimes we see only half of the side of the moon which faces us. The sun is shining half on this side and half on the far side.

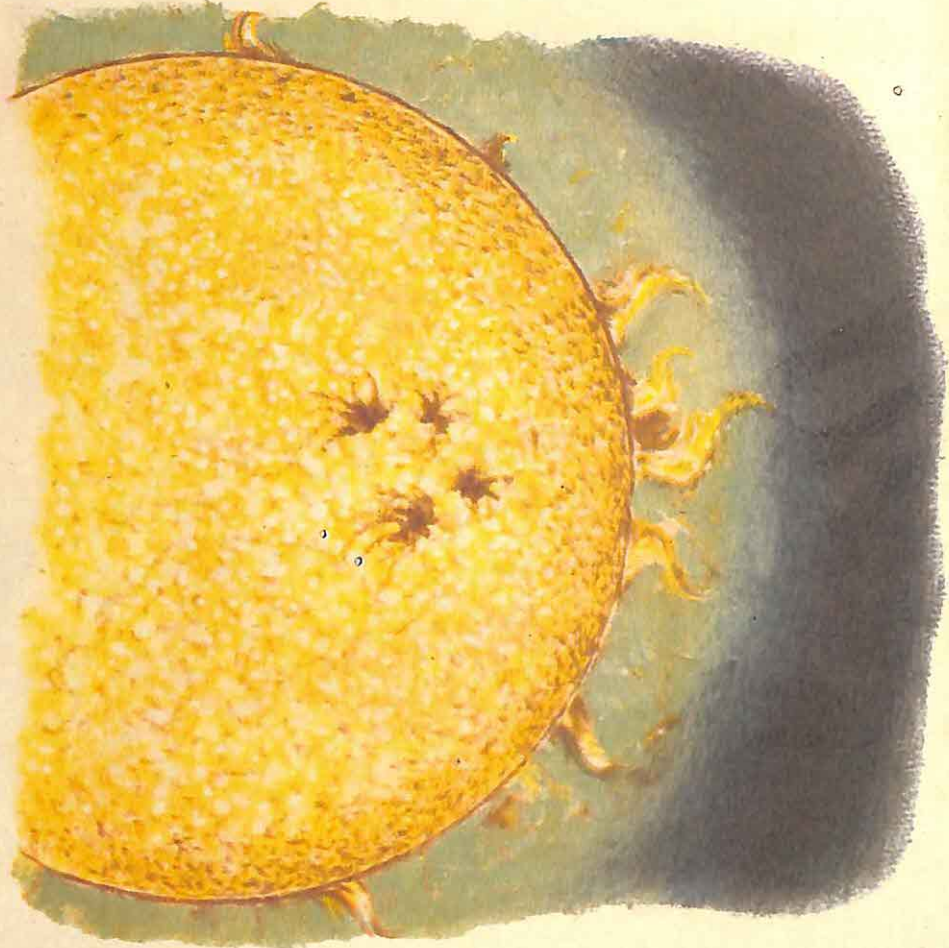


Sometimes we see a thin, curved part of the moon. This is the new moon, or crescent moon. Then the sun is shining mostly on the side of the moon that faces away from us.



Sometimes we can't see the moon at all. Then the sun is shining on the side of the moon that we cannot see.





Another neighbour of Earth is the sun.

The sun is many, many times larger
than Earth.

The sun is a great ball of very hot gases.
It is millions of miles away.



The sun gives us life.

Without the sun we would have no food.

The heat and light of the sun makes plants grow. Many animals eat the plants.

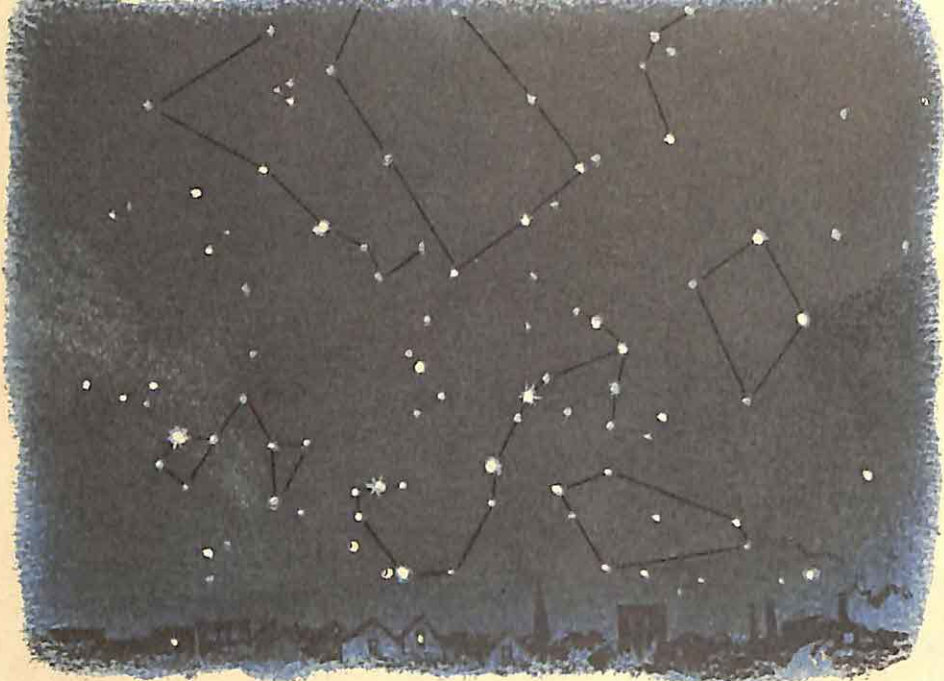
We eat some of the plants and animals.

The sun gives us our daylight and our moonlight. It gives us our seasons of spring, summer, autumn and winter.

The sun makes our weather. Because of the sun, we have winds, storms, and fine sunny days.

Without the heat of the sun, Earth would be freezing cold. All water would turn to ice. Every plant would die.

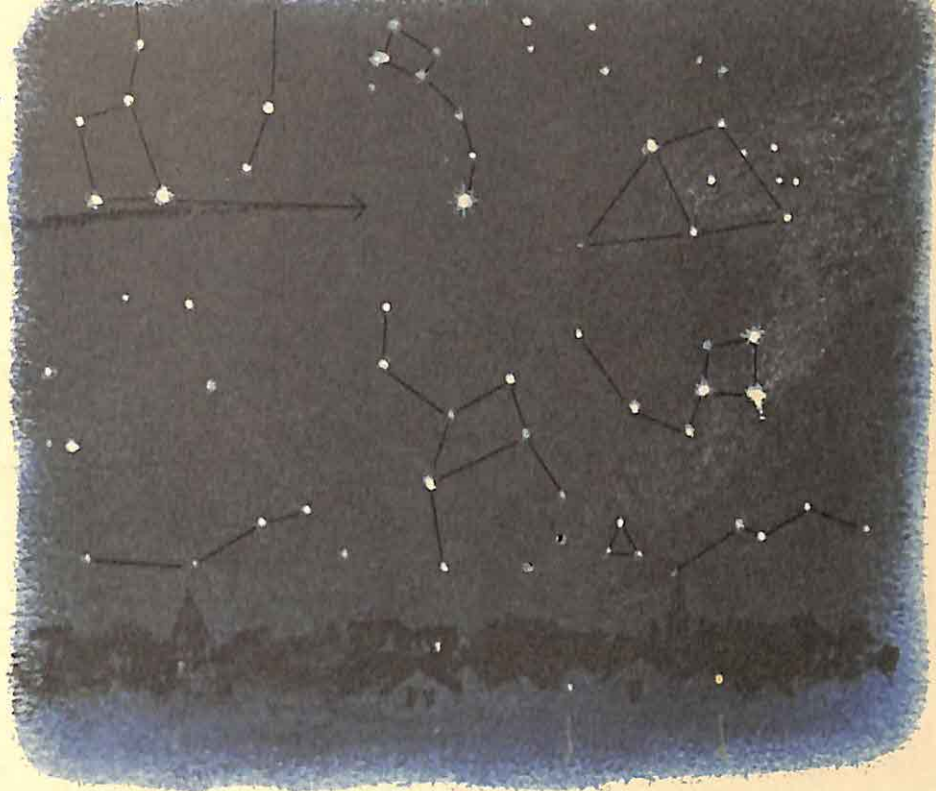
Every animal would die.



Our sun is a star. There are many, many stars in space; so many that we cannot count them all, even with a telescope.

Some of the stars are much larger than our sun. They look smaller because they are so far away.

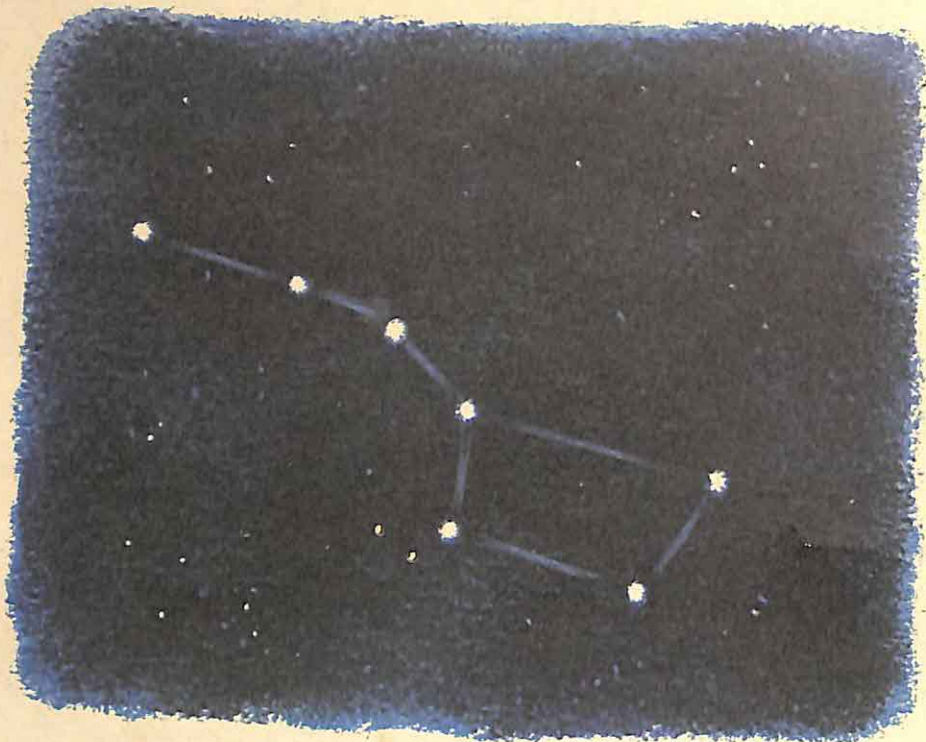
All stars give off heat and light, as our sun does. But we cannot feel the heat of the other stars. They are too far away.



If we look up at the sky at night, we can see many groups of stars.

The groups make patterns. Some of the patterns made people of long ago think of animals and other things.

These groups of stars are called constellations.

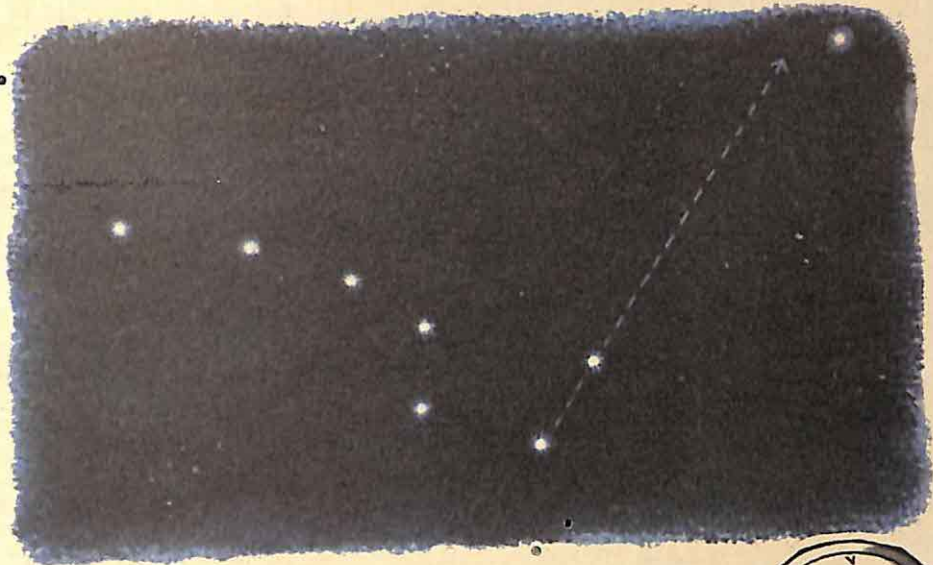


The Plough

People of long ago gave names to all of these constellations.

Ask someone to point out to you the constellation which is called the Plough. Another name for it is the Great Bear.

The Plough has seven bright stars. You can see it in the northern sky.

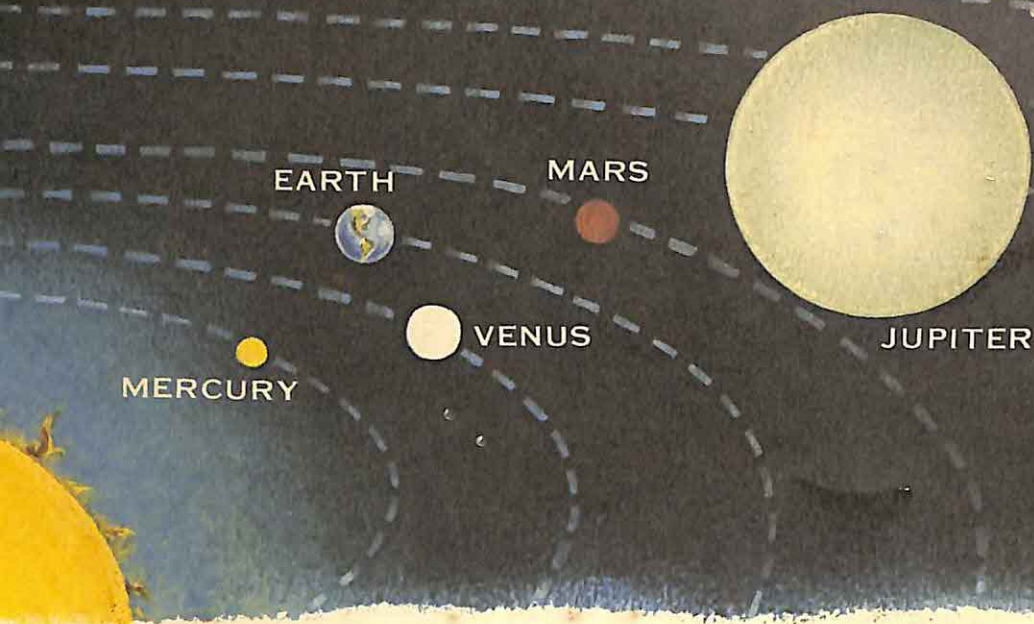


The Plough is a useful constellation.

The two stars at one end of it always point to the Pole Star.

Whenever we are facing the Pole Star we know we are facing north.

Boy Scouts tell directions at night by finding the Pole Star. Sailors may use the Pole Star to help them find their way at sea.

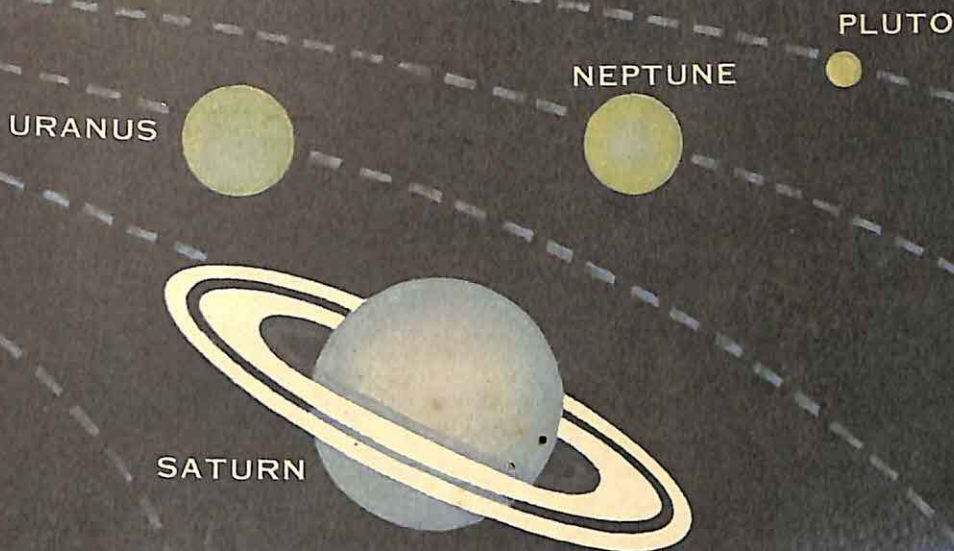


Some of the lights in the sky that look like stars are really planets.

Earth is a planet.

Some planets are hotter than the Earth, at least on the sunny side. But some are very cold indeed.

The planets reflect, or throw back, the light of the sun.



There are nine planets. The nine planets and the sun are called our solar system.

The sun is in the middle of our solar system. The planets travel round, or orbit, the sun.

Each planet has its own orbit. The planets do not bump into each other.



Mercury is the planet nearest to the sun. It is the smallest planet in our solar system. It has no water or air.

The same side of Mercury always faces the sun. This side is burning hot. The side that faces away from the sun is freezing cold.

Nothing can live or grow on Mercury.

After sunset, we can often see a single bright light above the golds and reds of the horizon sky. This is the Evening Star.

But it is not a star. It is the planet Venus. Sometimes Venus can be seen before sunrise, too. Then it is called the Morning Star.

Venus is about the size of Earth. It is closer to Earth than any other planet.

We cannot see what Venus is really like. It is covered with clouds.

Venus may be too warm for plants and animals.





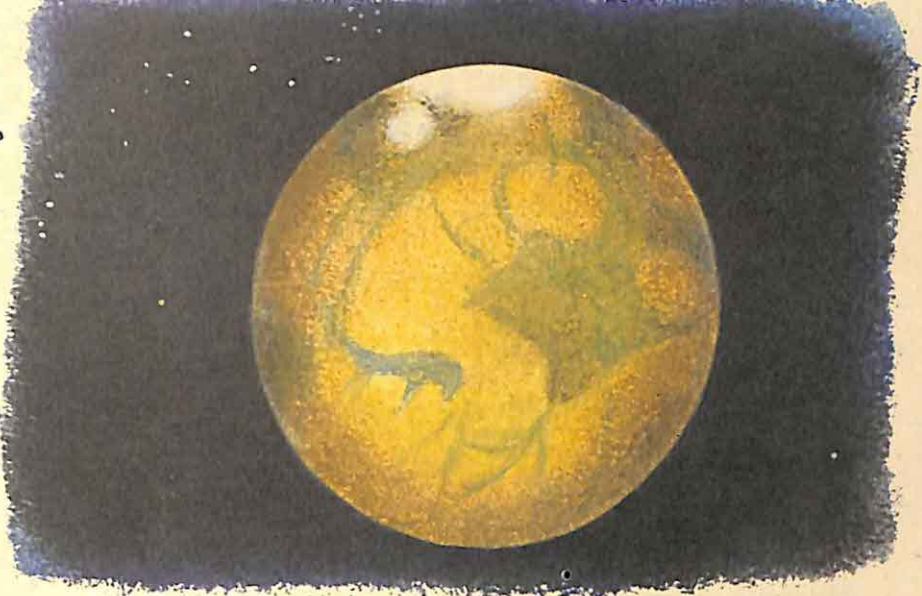
Earth is the third planet from the sun.

It takes Earth a year to travel round, or orbit, the sun. Earth spins like a top as it orbits the sun. It takes Earth exactly a day to spin round just once. This spin makes daytime and night-time.

The side of Earth that faces the sun has day. The side that faces away from the sun has night.

Almost every part of Earth has something living on it.

From Earth we use a telescope to see the moon, sun, other planets, and stars. A telescope makes our far-away neighbours look nearer and larger.



There may perhaps be some kind of life on the planet Mars.

During certain times of the year, parts of the planet look green. Perhaps green plants are growing. Some day we may find out for certain.

Mars is smaller than Earth, and farther away from the sun. It takes almost two of our years for Mars to orbit the sun.

Two moons orbit Mars. Each of them is much smaller than our moon.

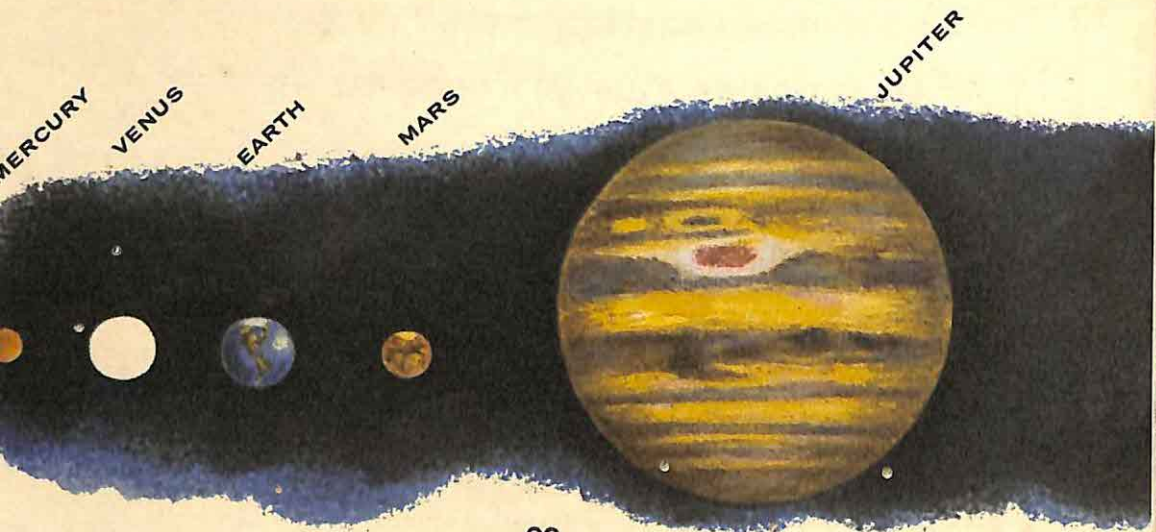


Jupiter is the largest and heaviest planet. It has twelve moons, more than any other planet.

Saturn is almost as big as Jupiter. It has nine moons. It is not a heavy planet. If we could place Saturn on water, it would float!

With a telescope, we can see rings round Saturn. Perhaps these rings are made of many tiny pieces of an old moon.

Jupiter and Saturn are too freezing cold for anything to live on them.

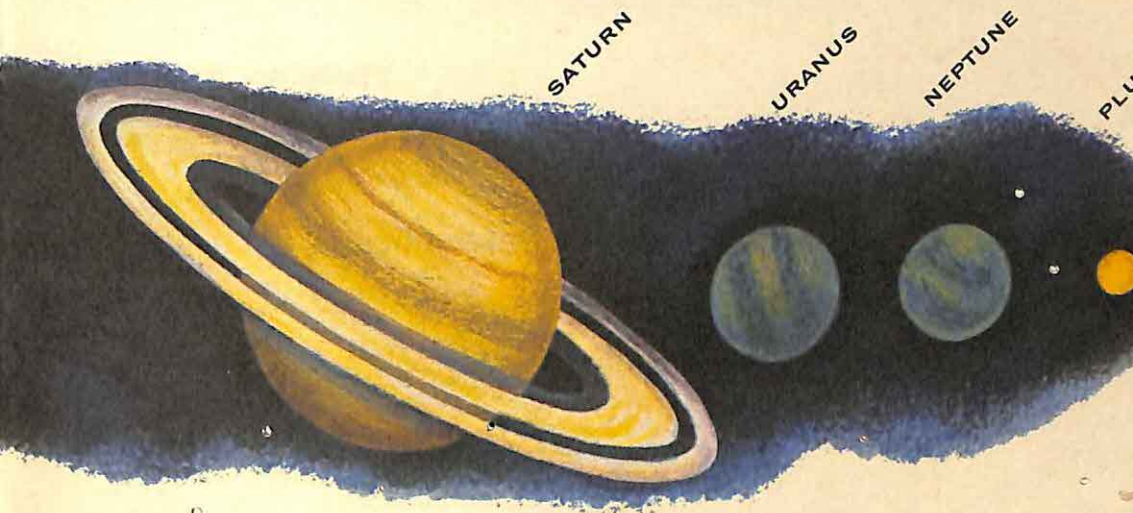


The three other planets of our solar system are so far away that we must use a telescope to see them at all.

They are far away from the heat and light of the sun. They are very cold. We think that nothing could live on them.

Uranus has five moons. Neptune has two moons.

Pluto was the last planet to be discovered. It has no moons that we can see. We need a very large telescope to see Pluto.





The Milky Way

Wait for a clear night when there are no clouds. Wait for a night when the moon is not shining.

Then go somewhere away from the bright street lights of a town.

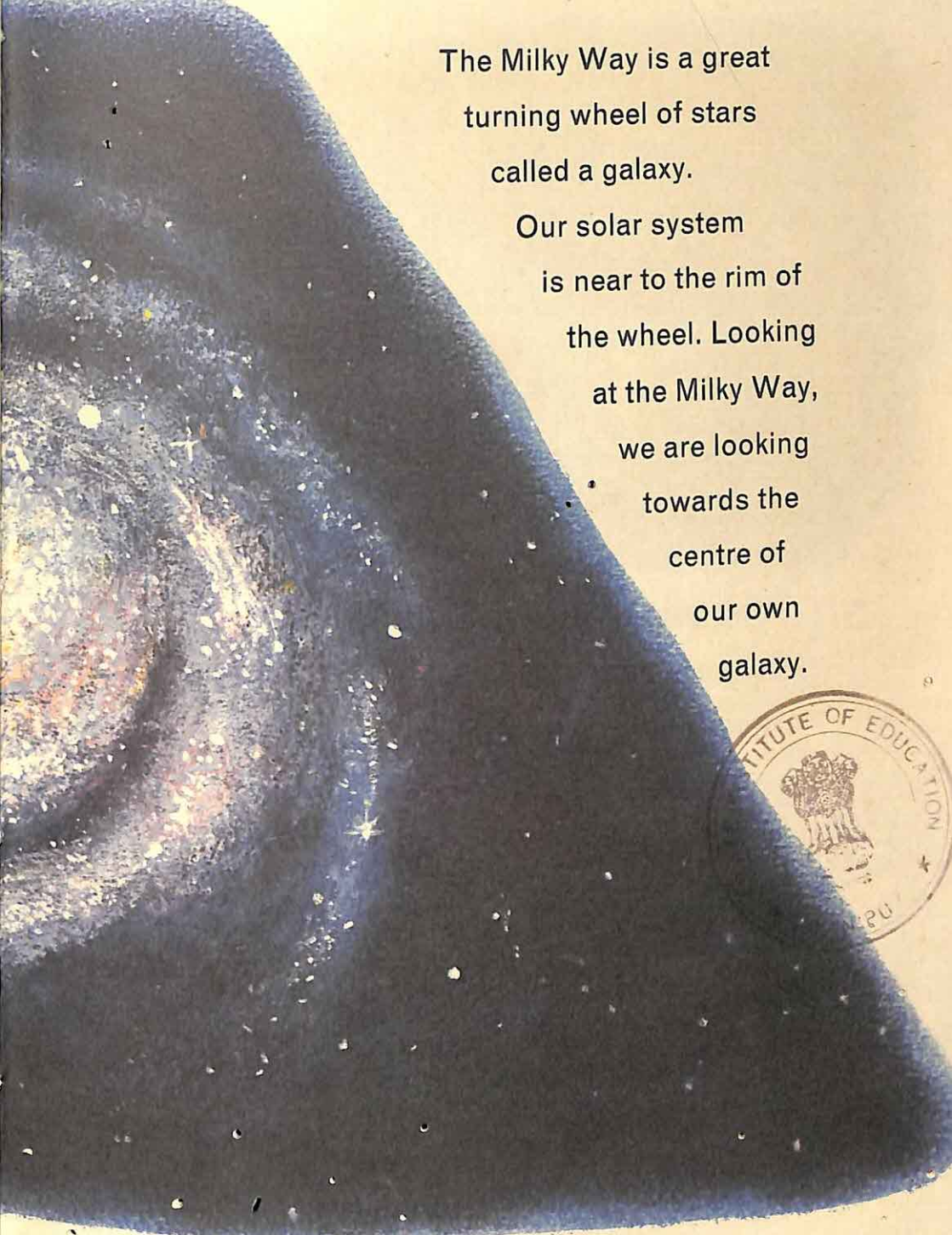


Now look up at the sky. Look high up
over your head.

Do you see a long cloud of stars?
That is the Milky Way.

Our sun is only one of millions and
millions of stars in the Milky Way.

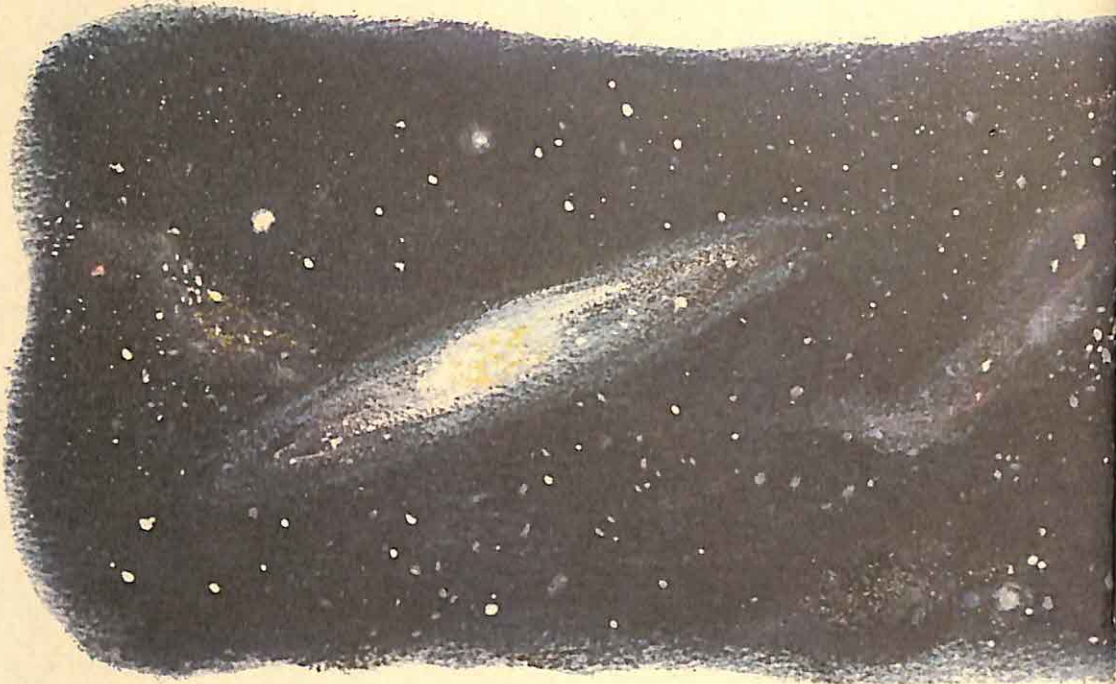




The Milky Way is a great
turning wheel of stars
called a galaxy.

Our solar system
is near to the rim of
the wheel. Looking
at the Milky Way,
we are looking
towards the
centre of
our own
galaxy.





The Milky Way galaxy is big. It is hard even to think about anything so big.

But the Milky Way is only a small part of the whole of space.

Great telescopes show us that there are many galaxies in space. Some look like turning wheels.

Others look like round balls or flat plates. All of them contain countless numbers of stars.



These galaxies are millions and millions of miles away from each other.

Our Earth, our solar system, our Milky Way galaxy, and all the other galaxies and all of space make up the Universe.

The Universe goes on and on, as far as any telescope can see.

Every day we are learning more about the Universe.

Things you can do

Learn how we have daytime and night-time. Get a globe of the Earth, one that spins. Find out just where on the globe you live. Put a mark on this spot, or stick a small cut-out figure on the spot. Get a flashlight or a lamp with the shade taken off. This will act as the sun.

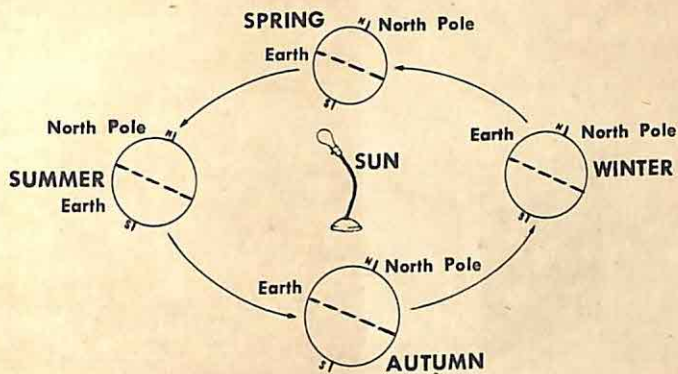
Now darken the room. Shine the flashlight or lamp on the part of the globe where you live. See how the sun can only shine on one half of Earth at one time. When this half is light, the other half is dark. The half that is light has daytime. The half that is dark has night-time.

Now spin the globe very slowly. Spin the globe from west to east. Looking down at the North Pole spin the globe counter-clockwise. This is the way Earth spins. It takes Earth 24 hours to spin round just once. We call this time one day. See how, as Earth spins, the part you live on is light, then becomes dark, and then is light again. When it is daytime in Great Britain, it is night-time on the opposite side of the Earth.

Learn how we get summer, autumn, winter, and spring. This happens because Earth is not straight up and down when it spins. Earth is tilted a little. See how your classroom globe is made to tilt. As Earth travels round the sun, this tilt gives us our four seasons.

Place a lamp without a shade on the centre of a table. A flexible lamp is best to use, because you can bend it so that the lamp will shine right on the globe. Now put a globe of Earth to one side of the lamp, so that the North Pole is tilted towards the lamp. Try to get the lamp to shine directly on the globe. The lighted bulb of the lamp is the sun. The globe is Earth. Darken the room. See how the sun shines more directly on the upper or northern part of Earth than on the southern or lower part of Earth. This means that the northern part has summer while the southern part has winter. Spin

the globe round once. See how the days are longer than the nights in the northern part, while the nights are longer than the days in the southern part.



Now put the globe of Earth to the other side of the lamp. The sun now shines more directly on the southern part of the Earth and the days are longer there. The sun shines obliquely on the northern part of the Earth, and the days are shorter. It is winter there.

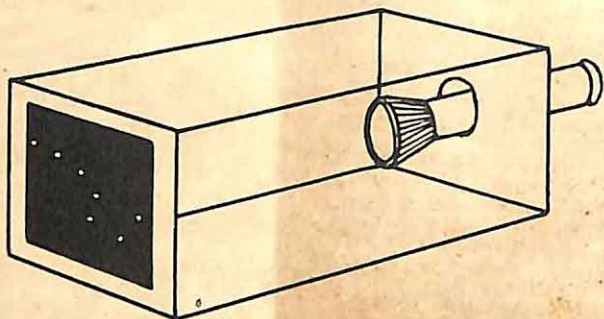
Now put the globe first in front of, then at the back of the lamp. Both the northern part and the southern part of Earth are in a similar position in relation to the sun. Their days and nights are just as long. This is our autumn and spring.

Make a constellation box. First get a man's shoe box. Then cut a large rectangle out of one end of the box. Get some black paper and cut out sheets a little larger than the hole you cut in the shoe box.

Look at a picture showing the Plough. Put dots on one sheet of black paper, so that the dots look just like the stars in the Plough. With a needle punch holes just where the dots are.

With cellulose tape stick the black sheet of paper over the hole in the end of the box. At the other end of the box cut a hole just large enough for the head of a flashlight to enter. Put the flashlight in the hole, darken the room, and turn on the flashlight.

Now look at the black sheet of paper. You will see the Plough just as it looks in the sky. If you cannot see the dots of light clearly, make the holes larger. Examine other constellations in the same way.



Words younger children may need help with

(Numbers refer to pages on which the word first appears)

- | | | |
|--------------|-----------------|--------------|
| 5 aeroplane | 11 daylight | 18 Mercury |
| space | moonlight | burning |
| Earth | seasons | 19 Venus |
| 6 neighbours | freezing | 20 telescope |
| nearest | 12 star | 21 Mars |
| rough | telescope | 22 Jupiter |
| 7 orbit | 13 patterns | Saturn |
| travels | constellation | 23 Uranus |
| behaves | 14 Plough | Neptune |
| 8 mirror | northern | Pluto |
| reflects | 15 directions | 27 galaxy |
| shining | sailors | 29 universe |
| 9 curved | 16 planet | |
| crescent | 17 solar system | |



The Dolphin Science Books

- 1 **Ants** Charles A. Schoenknecht
- 2 **Magnets** Edward Victor
- 3 **Space** Marian Tellander
- 4 **Your Body** Robert J. R. Follett
- 5 **Machines** Edward Victor
- 6 **Plants With Seeds**
Dorothy Wood
- 7 **Rocks and Minerals**
Lou Williams Page
- 8 **Sound** Charles D. Neal

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